

# What a decade of multi-wavelength observations can tell us about the nature of blazars? The case of 1ES 1215+303

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Blazars are known for their variability on a wide range of timescales at all wavelengths. Their classification into flat spectrum radio quasars, low-, intermediate- or high-frequency-peaked BL Lac (FSRQ, LBL, IBL, HBL, respectively) is based on broadband spectral characteristics that do not account for possible different activity states of the source. Recently, it was proposed that blazars could be classified according to the kinematics of their radio features. Most studies of TeV gamma-ray blazars focus on short timescales, especially during flares, due to the scarcity of observational campaigns or due to the relatively young existence of specialized, sensitive enough detectors.

Thanks to a decade of observations from the Fermi-LAT and VERITAS, we present an extensive study of the long-term multi-wavelength variability of the blazar 1ES 1215+303. This unprecedented data set reveals multiple strong gamma-ray flares and a long-term increase in the gamma-ray and optical flux baseline of the source over the ten-year period, which results in a linear correlation between these two energy bands over a decade.

Typical HBL behaviors were identified in the radio morphology of the source. However, analyses of the broadband SED at different flux states, unveils an extreme shift in energy of the synchrotron peak frequency from IR to soft X-rays. This evidences that the source exhibits IBL characteristics during quiescent states and HBL behavior during high states. A two-component synchrotron self-Compton model is used to describe this dramatic change.

The different methods applied and presented in this work provide a complete and detailed panorama of the intricate nature of blazars, and possibly even challenge our current classification scheme. Moreover, this work demonstrates the rewarding potential of blazars long-term studies that will be accessible, and potentially improved, thanks to future imaging atmospheric instruments, such as the Cherenkov Telescope Array (CTA).

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